

Applicant: Tomomi Yamanobe
Appl. No.: 09/893,487

Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-5 and 7-15 are pending in the application, with claim 1 being the independent claim. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above Amendment and the following Remarks, Applicant respectfully requests that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Rejections under 35 U.S.C. § 103

Claims 1-5 and 7-15 have been rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 6,165,802 to Cuchiaro et al. ("Cuchiaro") in view of U.S. Patent Nos. 6,174,766 to Hayashi et al. ("Hayashi") and 6,249,014 to Bailey. Applicant respectfully disagrees and traverses this rejection.

As per claim 1, the Office Action fails to establish a *prima facie* case of obviousness because the combination of Cuchiaro in view of Hayashi and Bailey does not teach or suggest the claimed invention.

Claim 1, as amended, recites:

A wiring layer structure connected to a first electrode of a ferroelectric capacitor having first and second electrodes, comprising:

a main wiring layer including a first material; and

a coating layer including *a first coating part* provided between said main wiring layer and said first electrode, *a second coating part* provided on the top surface of said main wiring layer, and *a third coating part* covering side faces of said main wiring layer;

wherein said first material reacts with a substance to produce a reducing agent, said substance being infiltrated from the outside to this main wiring layer, and *said coating layer is conductive and comprises a second material for preventing the infiltration of said substance into said main wiring layer.*

For example, reading claim 1 on the embodiment illustrated in figure 1, a wiring layer structure connected to a first electrode of a ferroelectric capacitor having first and second electrodes is provided. The wiring structure comprises a main wiring layer 30 and a coating layer on the outer periphery of this main wiring layer. The main wiring layer comprises a first material that reacts with a substance that infiltrates from the outside to this main wiring layer to produce a reducing agent.

The coating layer comprises a first coating part 20 provided between the main wiring layer and the first electrode; a second coating part 50 provided on the top surface of the main wiring layer and a third coating part 40 covers the side faces of the main wiring layer. The coating layer is conductive and comprises a second material for preventing infiltration in the main wiring layer of the substance.

The three distinct coating parts of Applicant's amended claim 1 advantageously prevent any reaction between substances, i.e., water or molecular hydrogen, on the surface of the main wiring layer. Because no reducing agent is provided in the main wiring layer, Applicant's

invention more effectively prevents a degradation of the characteristics of a ferroelectric capacitor that is caused by the reaction.

The Examiner admits that Cuchiaro fails to teach or suggest, among other things, a third coating provided on side faces of said main wiring layer, please see Sec. 5, Pg. 3 of the Office Action. Neither Hayashi nor Bailey supplements Cuchiaro to teach this claim recitation in the claimed combination of elements.

Hayashi teaches a semiconductor device and method of manufacturing the same. As shown in Fig. 9 of Hayashi, contact holes 22 extend to upper capacitor electrodes 14, col. 12, lns 41-48. A second barrier file 23 is formed in the bottom of the second contact holes 22, col. 13, lns. 19-22 and Fig. 10. A wiring film 26 is formed on top of barrier layer 23. Barrier layer 23 is provided in the bottom of contact holes 22 in order to prevent deteriorating a metallic oxide dielectric film of the capacitor. The barrier layer 23 does not cover side surfaces of the wiring layer 23. As shown in Fig. 13, the side surfaces of wiring layer 26 are exposed and in contact with interlayer insulating film 27. Thus, there is no teaching or suggestion in Hayashi of a third coating covering side faces of said main wiring layer as recited in independent claim 1.

Bailey does not supplement Cuchiaro or Hayashi to teach or suggest of a third coating covering side faces of said main wiring layer. Bailey teaches hydrogen barrier encapsulation techniques. For example, in Fig. 10B, a ferroelectric capacitor 1172 including an upper electrode 1182 is illustrated. A metal wiring layer 1192 is provided over the capacitor 1172. A hydrogen barrier material 1190 covers the ferroelectric capacitor elements, an inner surface of a contact

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hole, and a portion of a bottom of metal layer 1192, see Fig. 10B and col. 13, lns. 1-21. However, the hydrogen barrier material does not cover side surfaces of wiring layer 1192. The side surfaces of wiring layer 1192 are in contact with an interlayer insulating film. Thus, there is no teaching or suggestion in Bailey of a third coating covering side faces of said main wiring layer as recited in independent claim 1.

Accordingly, the cited references taken alone or in combination do not teach or suggest the features recited in amended claim 1. Claims 2-5 and 7-15 are also patentable based on their dependency from claim 1. Therefore the withdrawal of this rejection is respectfully requested.

Conclusion

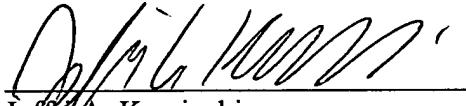
All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is hereby invited to telephone the undersigned at the number provided.

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Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,

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